Docket No. 1317.1068

IN THE UNITED STATES PATENT AND TRADEMARK OFFICE

In re Application of:

Chong-Mok Park

Serial No. 09/679,069 Group Art Unit: 2621

Filed: October 5, 2000 Examiner: Jamie J. Vent

For: VIDEO STREAM PROCESSING METHOD FOR TIME-DELAYED VIEWING

RESPONSE TO NOTICE OF NON-COMPLIANT APPEAL BRIEF

Assistant Commissioner for Patents
Washington, D.C. 20231

Sir:

The following is respectfully submitted in response to the Notice of Non-Compliant Appeal Brief mailed October 23, 2007. The Status of the Claims has been amended herein.

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APPEAL BRIEF

Assistant Commissioner for Patents
Washington, D.C. 20231

Sir:

In a Notice of Appeal filed August 3, 2007, the Applicants appealed the Examiner's April 3, 2007 Office Action finally rejecting claims 1-32. Therefore, Appellants' Brief is due October 3, 2007. Appellants' Brief, together with the requisite fee set forth in 37 C.F.R. § 1.17, is submitted herewith.

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I. Real Party in Interest (37 C.F.R. § 41.37(c)(1)(i))

The real party in interest in this Appeal is Samsung Electronics Co., Ltd., the assignee of the subject application.

II. Related Appeals and Interferences (37 C.F.R. § 41.37(c)(1)(ii))

Appellants, Appellants' legal representatives, and the assignee are not aware of any other appeals or interferences which will directly affect or be directly affected by, or have a bearing on, the Board's decision in the pending Appeal.

III. Status of Claims (37 C.F.R. § 41.37(c)(1)(iii))

Appealed claims 1-32 have been finally rejected. Claims 1-32 are appealed. These are the only pending claims in the subject application.

IV. Status of Amendments (37 C.F.R. § 41.37(c)(1)(iv))

Appellants' Amendment filed June 29, 2007 was not entered as indicated by the Advisory Action mailed July 12, 2007.

V. Summary of Claimed Subject Matter (37 C.F.R. § 41.37(c)(1)(v))

The present invention relates to a video stream processing method, a broadcast receiving system, and a recording medium in a broadcast receiving system.

Referring to Figs. 6 and 7 and p. 7, line 19 – p. 11, line 8, the present claimed invention set forth in claim 1 of a video stream processing method in a broadcast receiving system for time-delayed viewing, which includes disks having control information required for recording an input signal and reproducing recorded information recorded and a drive for driving the disks (see Figs. 6 and 7; see also p. 3, lines 25-28, for example). The video stream processing method includes sequentially assigning free blocks as discontinuous circular buffer blocks in a disk recording area (see Fig. 7, operations 230, 300, 410; see also p. 9, lines 16-29, for example). The assigning of free blocks is based on the control information when a time-delayed viewing mode is selected (see Fig. 7; see also p. 9, lines 3-8). The method further includes recording video streams for time-delayed viewing in the assigned circular buffer blocks (see Fig. 7, operations 240, 330, 420; see also p. 9, lines 7-8; see also p. 10, lines 25-26, for example).

Referring to Figs. 6 and 7 and p. 7, line 19 – p. 11, line 8, the present claimed invention set forth in claim 9 of a video stream processing method in a broadcast receiving system for time-delayed viewing, which includes a hard disk drive having control information required for recording an input signal and reproducing recorded information recorded in a predetermined area (see Figs. 6 and 7; see also p. 3, lines 25-28, for example). The video stream processing method includes sequentially assigning free blocks as discontinuous circular buffer blocks in a disk recording area (see Fig. 7, operation 300; see also p. 9, lines 16-29, for example). The method further includes recording video streams for time-delayed viewing in the assigned circular buffer blocks (see Fig. 7, operations 310; see also p. 10, lines 7-8, for example). The assigning of free blocks is based on the control information when a time-delayed viewing mode is selected (see Fig. 7; see also p. 9, lines 3-8, for example). The method includes assigning free blocks of the disk recording area and recording video streams of a channel to be recorded in the assigned free blocks when a recording mode is selected during the time-delayed viewing mode (see Fig. 7, operations 200, 210, 300, 310; see also p. 10, lines 3-6, for example). The method additionally includes assigning free blocks nearest to the recorded free blocks as the

circular buffer blocks, and recording the video streams for time-delayed viewing in the assigned circular buffer blocks (see Fig. 7, operations 320, 330; see also p. 10, lines 6-8, for example).

Referring to Figs. 6 and 7 and p. 7, line 19 – p. 11, line 8, the present claimed invention set forth in claim 12 of a video stream processing method in a broadcast receiving system for time-delayed viewing, which includes a hard disk drive having control information required for recording an input signal and reproducing recorded information recorded in a predetermined area (see Figs. 6 and 7; see also p. 3, lines 25-28, for example). The video stream processing method includes sequentially assigning free blocks as discontinuous circular buffer blocks in a disk recording area (see Fig. 7, operation 300; see also p. 9, lines 16-29, for example). The method further includes recording video streams for time-delayed viewing in the assigned circular buffer blocks (see Fig. 7, operations 310; see also p. 10, lines 7-8, for example). The assigning of free blocks is based on the control information when a time-delayed viewing mode is selected (see Fig. 7; see also p. 9, lines 3-8, for example). The method includes assigning free blocks of the disk recording area, recording video streams of a channel to be recorded in the assigned free blocks, assigning free blocks nearest to the recorded free blocks as the circular buffer blocks, and recording video streams for time-delayed viewing in the assigned circular buffer blocks, when a recording mode is selected together with the time-delayed viewing mode (see Fig. 7, operations 200, 210, 300, 310, 320, 330; see also p. 10, lines 3-8, for example). The method additionally includes reading free blocks to be reproduced based on the control information, assigning free blocks nearest to the reproduced free blocks as the circular buffer blocks, and recording the video streams for time-delayed viewing in the assigned circular buffer blocks, when a reproduction mode is selected together with the time-delayed viewing mode (see Fig. 7, operations 200, 220, 400, 410, 420; see also p. 10, lines 21-26, for example).

Referring to Figs. 6 and 7 and p. 7, line 19 – p. 11, line 8, the present claimed invention set forth in claim 14 of a video stream processing method in a broadcast receiving system for time-delayed viewing, which includes a hard disk drive having control information required for recording an input signal and reproducing recorded information recorded in a predetermined area (see Figs. 6 and 7; see also p. 3, lines 25-28, for example). The video stream processing method includes sequentially assigning free blocks as discontinuous circular buffer blocks in a disk recording area (see Fig. 7, operation 300; see also p. 9, lines 16-29, for example). The

method further includes recording video streams for time-delayed viewing in the assigned circular buffer blocks (see Fig. 7, operations 310; see also p. 10, lines 7-8, for example). The assigning of free blocks is based on the control information when a time-delayed viewing mode is selected (see Fig. 7; see also p. 9, lines 3-8, for example). The method additionally includes reading blocks to be reproduced based on the control information, assigning free blocks nearest to the reproduced free blocks as the circular buffer blocks, and recording the video streams for time-delayed viewing in the assigned circular buffer blocks, when a reproduction mode is selected together with the time-delayed viewing mode (see Fig. 7, operations 200, 220, 400, 410, 420; see also p. 10, lines 21-26, for example).

Referring to Figs. 6 and 7 and p. 7, line 19 – p. 11, line 8, the present claimed invention set forth in claim 15 of a video stream processing method in a broadcast receiving system for time-delayed viewing, which includes a hard disk drive having control information required for recording an input signal and reproducing recorded information recorded in a predetermined area (see Figs. 6 and 7; see also p. 3, lines 25-28, for example). The video stream processing method includes assigning free blocks of a recording disk area (see Fig. 7, operation 300; see also p. 10, lines 4-7, for example). The method also includes recording video streams of a channel to be recorded in the assigned free blocks (see Fig. 7, operation 310; see also p. 10, lines 7-8). The method additionally includes assigning free blocks nearest to the recorded free blocks as circular buffer blocks and recording the video streams for time-delayed viewing in the assigned circular buffer blocks (see Fig. 7, operations 200, 220, 400, 410, 420; see also p. 10, lines 21-26, for example).

Referring to Figs. 6 and 7 and p. 7, line 19 – p. 11, line 8, the present claimed invention set forth in claim 16 of a video stream processing method in a broadcast receiving system for time-delayed viewing, which includes a hard disk drive having control information required for recording an input signal and reproducing recorded information in a predetermined area (see Figs. 6 and 7; see also p. 3, lines 25-28, for example). The video stream processing method includes reading blocks to be reproduced based on the control information (see Fig. 6, operation 100; see also p. 8, lines 7-12, for example. The video stream processing method further includes assigning free blocks nearest to the reproduced free blocks as circular buffer blocks (see Fig. 7, operations 230, 300, 410; see also p. 9, lines 16-29, for example). Further, the

video streams are recorded for time-delayed viewing in the assigned circular buffer blocks (see Fig. 7, operations 240, 330, 420; see also p. 9, lines 7-8; see also p. 10, lines 25-26, for example).

Referring to Figs. 6 and 7 and p. 7, line 19 – p. 11, line 8, the present claimed invention set forth in claim 17 of a video stream processing method in a broadcast receiving system includes recording a video stream in free blocks of a disk recording area or reading a recorded video stream recorded in the disk recording area (see Figs. 6 and 7; see also p. 3, lines 25-28, for example). The video stream processing method in a broadcast receiving system further includes assigning free blocks nearest to the recorded or reproduced free blocks as circular buffer blocks (see Fig. 7, operations 230, 300, 410; see also p. 9, lines 16-29, for example).

Referring to Figs. 4A, 4B and 5 and p. 6, line 16 – p. 7, line 18, the present claimed invention set forth in claim 18 of a recording medium in a broadcast receiving system having a hard disk drive. The recording medium includes a video stream storing area which records video streams, wherein the video stream storing area comprises video stream blocks which are arranged discontinuously (see Fig. 4A and p. 6, lines 23-27, for example). The recording medium further includes a control information area which stores control information relating to the video stream storing area (see Fig. 4A and p. 6, lines 23-29, for example).

Referring to Figs. 6 and 7 and p. 7, line 19 – p. 11, line 8, the present claimed invention set forth in claim 21 of a broadcast receiving system includes a hard disk drive having a hard disk as a recording medium, the recording medium having control information for recording an input signal and reproducing recorded information (see Figs. 6 and 7; see also p. 3, lines 25-28, for example). The broadcast receiving system further includes a controller which sequentially assigns free blocks as discontinuous circular buffer blocks on the recording medium, based upon the control information in response to a time-delayed viewing mode being selected, and which records video streams for time-delayed viewing in the assigned circular buffer blocks (see Fig. 7, operations 230, 300, 410; see also p. 9, lines 16-29, for example).

Referring to Figs. 6 and 7 and p. 7, line 19 – p. 11, line 8, the present claimed invention set forth in claim 32 of a broadcast receiving system includes a hard disk drive having a hard disk as a recording medium, the recording medium having control information for recording an

input signal and reproducing recorded information (see Figs. 6 and 7; see also p. 3, lines 25-28, for example). The broadcast receiving system further includes a controller which records a video stream in free blocks of the recording medium or reads a recorded video stream recorded on the recording medium and assigns free blocks nearest to the recorded or reproduced free blocks as circular buffer blocks (see Fig. 7, operations 230, 300, 410; see also p. 9, lines 16-29, for example).

None of the claims contain an element expressed as a means or step for performing a specified function without the recital of structure, material, or acts in support thereof.

VI. Grounds of Rejection to be Reviewed on Appeal (37 C.F.R. § 41.37(c)(1)(vi))

Claims 1-6, 8, and 18-20 were rejected under 35 USC 103(a) as being unpatentable over McIlvain et al. (US 5,765,200) (hereinafter "McIlvain") in view of Barton et al. (US 6,233,389) (hereinafter "Barton").

Claims 21, 23-26, 28-32 were rejected under 35 USC 103(a) as being unpatentable over Aoki et al. (US 6,099,231) (hereinafter "Aoki") in view of Barton.

Claims 7 and 9-17 were rejected under 35 USC 103(a) as being unpatentable over McIlvain in view of Barton and in further view of Aoki.

Claims 22 and 27 were rejected under 35 USC 103(a) as being unpatentable over Aoki in view of Barton and further in view of Peters et al. (US 5,884,284) (hereinafter "Peters").

VII. Argument (37 C.F.R. § 41.37(c)(1)(vii))

The References

McIlvain

McIlvain discusses logical positioning within a storage device by a storage controller. The techniques discussed in McIlvain are supposed to work equally as well with different architectures and make it possible to use the logical positioning mechanism with architectures that do not support channel subsystems. Further, the logical positioning mechanism can be used with file servers, workstations and personal computers, as examples. In the case of a personal computer, the storage controller may simply be a storage card having, for instance, a Small Computer System Interface (SCSI). The techniques of the logical positioning mechanism are applicable to any computer system using information stored on a storage device. See McIlvain, column 5, lines 3-14.

In McIlvain, the logical positioning technique is discussed in relation to a particular storage device, i.e., DASD; however, it is also applicable to other storage devices, such as, for example, optical devices. One example of a storage device 200 is depicted in FIG. 2. Storage device 200 includes, for instance, a plurality of data sets 202, each data set including a plurality of logical positions 204. Each logical position is addressable and is capable of having data stored therein or data read therefrom using an appropriate input/output command. In one example, a logical position can represent a block or a record on the storage device and can be addressed in a number of ways. For example, when the storage device is a Count Key Data (CKD) direct access storage device, the logical positions are addressable by indicating the cylinder (CC), head (HH) and record (R) numbers (CCHHR). However, other DASD and other storage devices are addressable in other ways. For example, it is possible to address a storage device using fixed block addressing or sector addressing. See McIlvain, column 5, lines 15-35 and Fig. 2.

Further in McIlvain, a data set can have one or more extents, and each extent includes one or more locations that can receive data. Additionally, one or more extents are associated with a host program through a session identifier. A session can represent one data set, multiple

data sets or one part of a data set. One or more hosts can be registered with a session. See McIlvain, column 5, lines 36-41.

As mentioned above in McIlvain, information is stored on or read from storage devices using input/output operations, such as read or write commands. In particular in the ESA/390 architecture, a host processor begins execution of a channel program, which includes one or more channel command words specifying the particular operations to be performed. Execution of the input/output operations is accomplished by the decoding and executing of one or more channel command words by the channel subsystem and the storage controller. See McIlvain, column 5, lines 42-52.

Barton

Barton discusses a multimedia time warping system. In Barton, the input stream flows through a parser 401. The parser 401 parses the stream looking for MPEG distinguished events indicating the start of video, audio or private data segments. For example, when the parser 401 finds a video event, it directs the stream to the video DMA engine 402. The parser 401 buffers up data and DMAs it into the video buffer 410 through the video DMA engine 402. At the same time, the parser 401 directs an event to the event DMA engine 405 which generates an event into the event buffer 413. When the parser 401 sees an audio event, it redirects the byte stream to the audio DMA engine 403 and generates an event into the event buffer 413. Similarly, when the parser 401 sees a private data event, it directs the byte stream to the private data DMA engine 404 and directs an event to the event buffer 413. The Media Switch notifies the program logic via an interrupt mechanism when events are placed in the event buffer. See Barton, column 5, lines 3-19.

Further in Barton, the event buffer 413 is filled by the parser 401 with events. Each event 501 in the event buffer has an offset 502, event type 503, and time stamp field 504. The parser 401 provides the type and offset of each event as it is placed into the buffer. For example, when an audio event occurs, the event type field is set to an audio event and the offset indicates the location in the audio buffer 411. The program logic knows where the audio buffer 411 starts and adds the offset to find the event in the stream. The address offset 502 tells the program logic

where the next event occurred, but not where it ended. The previous event is cached so the end of the current event can be found as well as the length of the segment. See Barton, column 5, lines 20-32 and Figs. 4 and 5.

Aoki

Aoki discusses reproduction of information using a ring buffer with read and write pointers separated from each other by substantially half of the total ring buffer capacity. In Aoki, motions of the write pointer WP and the read pointer RP in a ring buffer 4 during normal reproduction will be explained below with reference to FIGS. 4a, 4b and 4c. FIG. 4a shows a case when the read pointer RP is positioned at an address position R1 and the write pointer WP is positioned at an address position W1. The clockwise direction of the ring buffer 4 in the figure is considered to be the direction of the normal reproduction and writing/reading is performed in this direction. Note that because the address position R1 and the address position W1 are positioned so as to almost face each other across the ring buffer 4, the sizes of an unread data area URD and an already-read data area ARD become almost equal. See Aoki, column 7, line 59 – column 8, line 5 and FIGS. 4a, 4b and 4c.

Further in Aoki, FIG. 4b shows a state in which the read pointer RP advances to an address position R2 to read data out of the ring buffer 4, decreasing the unread data area and increasing the already-read data area. Detecting that state, the control circuit 8 controls the pickup 2 access to the disk 1 to read new data and advances the write pointer WP to an address position W2 shown in FIG. 4c so as to be able to write one sector of read data to the ring buffer 4. Thereby, the sizes of the unread data area and the already-read data area are rendered almost equal again. Note that the control circuit 8 makes such control at all times so that the sizes of the unread data area and the already-read data area always become almost equal. In this case, when no new data is read out of the disk 1, the pickup 2 is controlled so as to read data on the same track. See Aoki, column 8, lines 6-20 and FIG. 4b.

Still further in Aoki, when a control button is manipulated to switch the mode from the normal reproduction mode to the reverse reproduction mode for example, it is necessary to decode previous images already reproduced during the normal reproduction in a reversed time

sequence and to send the decoded images from the frame memory 6 to the display 7 to display them. However, in the case of the present invention, because the data already read is stored in the already-read data area in the ring buffer 4 as shown in FIG. 4, reversely reproduced images may be quickly displayed on the display 7 just by controlling the reading/writing of the ring buffer 4 so as to accommodate the reverse reproduction without controlling the pickup 2 to return to read new data. See Aoki, column 8, lines 21-34.

Peters

Peters discusses Telecommunication user account management system and method. In Peters, a converter tracking function provides a full inventory of all types of converter equipment and identifies the specific area or persons responsible for each converter. The converter equipment includes: addressable converters, converter handsets, digital cable radio tuners, and PRIMESTAR (Trademark) integrated receiver-decoders. These functions include: addressable converter control, exit from SAM, display converter history, display subscriber accounts, redisplay hello message, add, modify or delete converters, modify converters and print files. See Peters, column 10, lines 52-63.

Rejection of independent claims 1 and 18 under 35 USC 103(a) as being unpatentable over McIlvain in view of Barton

This rejection is respectfully appealed because the combination of the teachings of McIlvain and Barton does not suggest the following features recited in claim 1:

> sequentially assigning free blocks as discontinuous circular buffer blocks in a disk recording area, based on the control information when a time-delayed viewing mode is selected; and
>
> recording video streams for time-delayed viewing in the assigned circular buffer blocks.

Further, the combination of the teachings of McIlvain and Barton does not suggest the following features recited in claim 18:

a video stream storing area which records video streams, wherein the video stream storing area comprises video stream blocks which are arranged discontinuously; and

a control information area which stores control information relating to the video stream storing area.

The present invention according to claim 1, is directed to a method of video stream processing in which circular buffer blocks are arranged discontinuously such that time-delayed viewing of a channel can be implemented simultaneously with recording/reproduction of another channel. The method includes sequentially assigning free blocks as discontinuous circular buffer blocks in a disk recording area, based on control information when a time-delayed viewing mode is selected. Video streams are recorded for time-delayed viewing in the assigned circular buffer blocks.

By contrast, McIlvain discusses a storage device 200 including a plurality of data sets 202, each data set including a plurality of logical positions 204. The logical position can represent a block. McIlvain further discusses that it is possible to address a storage device using fixed block addressing or sector addressing. McIlvain does not suggest the sequential assigning of free blocks as discontinuous circular buffer blocks. McIlvain further does not discuss assigning free blocks as discontinuous buffer blocks based on the control information and does not suggest that video streams are recorded in the assigned circular buffer blocks. McIlvain discusses only that data sets can have one or more locations and that a logical position indicator stored within the storage controller can indicate the next logical position within the storage device to be accessed. McIlvain does not suggest sequentially assigning free blocks as discontinuous circular blocks based on control information when a time-delayed viewing mode is selected. McIlvain discusses that the logical positions 204 may be included in a data set 202 and that the logical positions 204 are addressable and capable of having data stored therein or data read therefrom. However, McIlvain does not discuss that the logical positions 204 are free blocks nor does McIlvain suggest that the logical positions 204 are free blocks sequentially assigned as discontinuous circular buffer blocks in a disk recording area, where the free blocks are assigned to form a circular buffer.

The Examiner has alleged that "discontinuous" circular buffer is interpreted to mean sectors on a hard disk. However, the logical positions 204 cannot be construed to be free blocks assigned to form a circular buffer where the free blocks are discontinuously sequentially assigned as circular buffer blocks which are not arranged continuously in a disk recording area. As shown in Fig. 2 of McIlvain, logical positions 204 are specifically arranged continuously in a disk recording area and are formed as a circular buffer, the circular buffer being, for example, one of the data sets 202.

Also, as conceded by the Examiner, McIlvain does not discuss or suggest the assigning of free blocks in a circular buffer being based on control information when a time-delayed viewing mode is selected. The Examiner indicates that Barton makes up for the deficiencies in McIlvain.

However, Barton only discusses that a video component is placed in a circular video buffer and an event is posted in the event buffer containing an indication that a video component was found and the location of the video component in the circular video buffer. Barton fails to make up for the deficiencies in McIlvain, specifically as to sequentially assigning free blocks to form a discontinuous circular buffer as circular buffer blocks in a disk recording area. Further, Barton fails to discuss or suggest that the sequential assigning of free blocks as discontinuous circular buffer blocks is based on control information when a time-delayed viewing mode is selected. Thus, Barton fails to make up for the deficiencies in McIlvain, specifically as to sequentially assigning free blocks as discontinuous circular buffer blocks not arranged continuously.

In addition, the combination of Barton and McIlvain does not suggest a video stream storing area which records video streams, where the video stream storing area comprises video stream blocks which are arranged discontinuously. The locations 204 in McIlvain are clearly arranged continuously as a circular buffer, the circular buffer being one of the data sets 202.

Rejection of independent claims 21 and 32 under 35 USC 103(a) as being unpatentable over Aoki in view of Barton

This rejection is respectfully appealed because the combination of the teachings of Aoki and Barton does not suggest the following features recited in claim 21:

> a controller which sequentially assigns free blocks as discontinuous circular buffer blocks on the recording medium, based upon the control information in response to a time-delayed viewing mode being selected, and which records video streams for time-delayed viewing in the assigned circular buffer blocks.

In addition, the combination of the teachings of Aoki and Barton does not suggest the following features recited in claim 32:

> a controller which records a video stream in free blocks of the recording medium or reads a recorded video stream recorded on the recording medium and assigns free blocks nearest to the recorded or reproduced free blocks as circular buffer blocks.

Aoki discusses a data reproducing method which allows for reverse reproduction in which, when a read pointer advances to read data, which decreases the unread data area and increases the already-read data area, the control circuit 8 controls the pick-up 2 to read new data and advances the write pointer to a new address position to be able to write one sector of read data to the ring buffer. Aoki discusses that data is stored in a circular buffer and the stored data may be retrieved in a first and a second direction, allowing for reverse reproduction. Aoki does not, however, discuss or suggest sequentially assigning free blocks as discontinuous circular buffer blocks on the recording medium, based upon the control information in response to a time-delayed viewing mode being selected, which records video streams for time-delayed viewing in the assigned circular buffer blocks. As discussed above with respect to independent claims 1 and 18, data being stored in a circular buffer does not suggest sequentially assigning free blocks as discontinuous circular buffer blocks on a recording medium. Aoki includes no discussion of discontinuous sequential assignment of free blocks, nor does Aoki discuss that the free blocks are assigned as discontinuous circular buffer blocks on a recording medium.

The Office Actions indicate that Barton makes up for the deficiencies in Aoki. As discussed above, Barton fails to make up for the deficiencies in Aoki, which are similar to the deficiencies in McIlvain. Specifically, Barton does not suggest sequential assignment of free blocks assigned to form a discontinuous circular buffer based on control information in response to a time-delayed viewing mode being selected.

Rejection of independent claims 9, 12 and 14-17 under 35 USC 103(a) as being unpatentable over McIlvain in view of Barton and in further view of Aoki

This rejection is respectfully appealed because the combination of the teachings of McIlvain, Barton and Aoki does not suggest the following features recited in independent claim 9:

> sequentially assigning free blocks as discontinuous circular buffer blocks in a disk recording area and recording video streams for time-delayed viewing in the assigned circular buffer blocks, based on the control information when a time-delayed viewing mode is selected; and
>
> assigning free blocks of the disk recording area and recording video streams of a channel to be recorded in the assigned free blocks when a recording mode is selected during the time-delayed viewing mode, assigning free blocks nearest to the recorded free blocks as the circular buffer blocks, and recording the video streams for time-delayed viewing in the assigned circular buffer blocks.

Further, the combination of the teachings of McIlvain, Barton and Aoki does not suggest the following features as recited in independent claim 12:

> sequentially assigning free blocks as discontinuous circular buffer blocks in a disk recording area and recording video streams for time-delayed viewing in the assigned circular buffer blocks, based on the control information when a time-delayed viewing mode is selected;
>
> assigning free blocks of the disk recording area, recording video streams of a channel to be recorded in the assigned free blocks, assigning free blocks nearest to the recorded free blocks as the circular buffer blocks, and recording video streams for time-delayed viewing in the assigned circular buffer blocks, when a recording mode is selected together with the time-delayed viewing mode; and

> reading free blocks to be reproduced based on the control information, assigning free blocks nearest to the reproduced free blocks as the circular buffer blocks, and recording the video streams for time-delayed viewing in the assigned circular buffer blocks, when a reproduction mode is selected together with the time-delayed viewing mode.

Additionally, the combination of the teachings of McIlvain, Barton and Aoki does not suggest the following features as recited in independent claim 14:

> sequentially assigning free blocks as discontinuous circular buffer blocks in a disk recording area and recording video streams for time-delayed viewing in the assigned circular buffer blocks, based on the control information when a time-delayed viewing mode is selected; and
>
> reading blocks to be reproduced based on the control information, assigning free blocks nearest to the reproduced free blocks as the circular buffer blocks, and recording the video streams for time-delayed viewing in the assigned circular buffer blocks, when a reproduction mode is selected together with the time-delayed viewing mode.

Also, the combination of the teachings of McIlvain, Barton and Aoki does not suggest the following features as recited in independent claim 15:

> assigning free blocks of a recording disk area;
>
> recording video streams of a channel to be recorded in the assigned free blocks;
>
> assigning free blocks nearest to the recorded free blocks as circular buffer blocks; and
>
> recording the video streams for time-delayed viewing in the assigned circular buffer blocks.

Further, the combination of the teachings of McIlvain, Barton and Aoki does not suggest the following features as recited in independent claim 16:

> reading blocks to be reproduced based on the control information;
>
> assigning free blocks nearest to the reproduced free blocks as circular buffer blocks; and
>
> recording video streams for time-delayed viewing in the assigned circular buffer blocks.

Also, the combination of the teachings of McIlvain, Barton and Aoki does not suggest the following features as recited in independent claim 17:

> recording a video stream in free blocks of a disk recording area or reading a recorded video stream recorded in the disk recording area; and
>
> assigning free blocks nearest to the recorded or reproduced free blocks as circular buffer blocks.

In arguments similar to the above with respect to independent claims 1, 18, 21 and 32, the combination of the teachings of McIlvain, Barton and Aoki fail to discuss or suggest sequentially assigning free blocks assigned to form a discontinuous circular buffer as circular buffer blocks in a disk recording area and recording video streams for time-delayed viewing in the assigned circular buffer blocks, based on the control information when a time-delayed viewing mode is selected. Neither McIlvain nor Aoki discuss sequentially assigning free blocks as discontinuous circular buffer blocks and do not discuss that video streams for time-delayed viewing are recorded in the assigned circular buffer blocks. As discussed above, Barton fails to make up for the deficiencies in McIlvain and Aoki. Specifically, Barton does not suggest that free blocks are sequentially assigned as discontinuous circular buffer blocks in a disk recording area. In addition, the combination of McIlvain, Barton and Aoki does not suggest assigning free blocks assigned to form a discontinuous circular buffer nearest to recorded free blocks as discontinuous circular buffer blocks. Therefore, claims 9, 12 and 14-17 patentably distinguish over the references relied upon.

Dependent Claims

Due to their dependence on one of claims 1, 9, 12, 18 and 21, respectively, it is further respectfully submitted that claims 2-8, 10, 11, 13, 19, 20 and 22-31 patentably distinguish over the relied upon references.

Conclusion

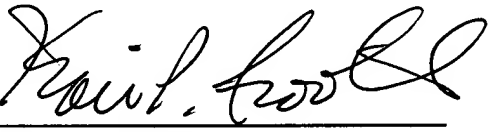
In summary, the Appellant submits that claims 1-32 patentably distinguish over the relied upon prior art. Reversal of the Examiner's rejections is respectfully requested.

The Commissioner is authorized to charge any Appeal Brief fee or Petition for Extension of Time fee for underpayment, or credit any overpayment, to Deposit Account No. 19-3935.

Respectfully submitted,

STAAS & HALSEY LLP

Date: 11/6/07

By: 

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VIII. Claims Appendix (37 C.F.R. § 41.37(c)(1)(viii))

1. (ORIGINAL) A video stream processing method in a broadcast receiving system for time-delayed viewing, which includes disks having control information required for recording an input signal and reproducing recorded information recorded and a drive for driving the disks, the video stream processing method comprising:

sequentially assigning free blocks as discontinuous circular buffer blocks in a disk recording area, based on the control information when a time-delayed viewing mode is selected; and

recording video streams for time-delayed viewing in the assigned circular buffer blocks.

2. (ORIGINAL) The video stream processing method of claim 1, further comprising updating the control information and setting a pointer of a write point to a last one of the assigned circular buffer blocks after the recording of the video streams.

3. (ORIGINAL) The video stream processing method of claim 1, wherein the sequentially assigning of the free blocks comprises assigning the free blocks as the circular buffer blocks in a track and sector number ascending order.

4. (ORIGINAL) The video stream processing method of claim 1, wherein the control information comprises file attribute information, file assignment information, free block information for each track, and circular buffer block information.

5. (ORIGINAL) The video stream processing method of claim 1, further comprising:

recovering the circular buffer blocks to the free blocks when the broadcast receiving system is initialized.

6. (ORIGINAL) The video stream processing method of claim 1, further comprising recovering the assigned circular buffer blocks to the free blocks and updating the control information when a next circular buffer block is assigned.

7. (ORIGINAL) The video stream processing method of claim 1, wherein the sequentially assigning free blocks comprises interleavedly assigning the free blocks for each video stream, if the video streams are of different channels to be recorded concurrently.

8. (ORIGINAL) The video stream processing method of claim 5, wherein the recovering of the circular blocks comprises updating information of one of the circular buffer blocks which is pointed by a pointer at a write point with free block information, the video stream processing method further comprising initializing the pointer.

9. (ORIGINAL) A video stream processing method in a broadcast receiving system for time-delayed viewing, which includes a hard disk drive having control information required for recording an input signal and reproducing recorded information recorded in a predetermined area, the video stream processing method comprising:

sequentially assigning free blocks as discontinuous circular buffer blocks in a disk recording area and recording video streams for time-delayed viewing in the assigned circular buffer blocks, based on the control information when a time-delayed viewing mode is selected; and

assigning free blocks of the disk recording area and recording video streams of a channel to be recorded in the assigned free blocks when a recording mode is selected during the time-delayed viewing mode, assigning free blocks nearest to the recorded free blocks as the circular buffer blocks, and recording the video streams for time-delayed viewing in the assigned circular buffer blocks.

10. (ORIGINAL) The video stream processing method of claim 7, further comprising updating the control information and setting a pointer of a write point to a last one of the assigned circular buffer block each time the video streams are recorded in the free blocks subsequent to the recording of the video streams for time-delayed viewing in the assigned circular buffer blocks.

11. (ORIGINAL) The video stream processing method of claim 9, wherein the free blocks nearest to the recorded free blocks are in a same track or a nearest track of the recorded free blocks.

12. (ORIGINAL) A video stream processing method in a broadcast receiving system for time-delayed viewing, which includes a hard disk drive having control information required for recording an input signal and reproducing recorded information recorded in a predetermined area, the video stream processing method comprising:

sequentially assigning free blocks as discontinuous circular buffer blocks in a disk recording area and recording video streams for time-delayed viewing in the assigned circular buffer blocks, based on the control information when a time-delayed viewing mode is selected;

assigning free blocks of the disk recording area, recording video streams of a channel to be recorded in the assigned free blocks, assigning free blocks nearest to the recorded free blocks as the circular buffer blocks, and recording video streams for time-delayed viewing in the assigned circular buffer blocks, when a recording mode is selected together with the time-delayed viewing mode; and

reading free blocks to be reproduced based on the control information, assigning free blocks nearest to the reproduced free blocks as the circular buffer blocks, and recording the video streams for time-delayed viewing in the assigned circular buffer blocks, when a reproduction mode is selected together with the time-delayed viewing mode.

13. (ORIGINAL) The video stream processing method of claim 12, wherein the free blocks nearest to the recorded free blocks are in a same track or a nearest track of the recorded free blocks.

14. (ORIGINAL) A video stream processing method in a broadcast receiving system for time-delayed viewing, which includes a hard disk drive having control information required for recording an input signal and reproducing recorded information in a predetermined area, the video stream processing method comprising:

sequentially assigning free blocks as discontinuous circular buffer blocks in a disk recording area and recording video streams for time-delayed viewing in the assigned circular buffer blocks, based on the control information when a time-delayed viewing mode is selected; and

reading blocks to be reproduced based on the control information, assigning free blocks nearest to the reproduced free blocks as the circular buffer blocks, and recording the video streams for time-delayed viewing in the assigned circular buffer blocks, when a reproduction mode is selected together with the time-delayed viewing mode.

15. (ORIGINAL) A video stream processing method in a broadcast receiving system for time-delayed viewing, which includes a hard disk drive having control information required for recording an input signal and reproducing recorded information in a predetermined area, the video stream processing method comprising:

assigning free blocks of a recording disk area;

recording video streams of a channel to be recorded in the assigned free blocks;

assigning free blocks nearest to the recorded free blocks as circular buffer blocks; and

recording the video streams for time-delayed viewing in the assigned circular buffer blocks.

16. (ORIGINAL) A video stream processing method in a broadcast receiving system for time-delayed viewing, which includes a hard disk drive having control information required for recording an input signal and reproducing recorded information in a predetermined area, the video stream processing method comprising:

reading blocks to be reproduced based on the control information;

assigning free blocks nearest to the reproduced free blocks as circular buffer blocks; and

recording video streams for time-delayed viewing in the assigned circular buffer blocks.

17. (ORIGINAL) A video stream processing method in a broadcast receiving system, the video stream processing method comprising:

recording a video stream in free blocks of a disk recording area or reading a recorded video stream recorded in the disk recording area; and

assigning free blocks nearest to the recorded or reproduced free blocks as circular buffer blocks.

18. (ORIGINAL) A recording medium in a broadcast receiving system having a hard disk drive, the recording medium comprising:

a video stream storing area which records video streams, wherein the video stream storing area comprises video stream blocks which are arranged discontinuously; and

a control information area which stores control information relating to the video stream storing area.

19. (ORIGINAL) The recording medium of claim 18, wherein the video stream storing area comprises:

circular buffer blocks which are discontinuously arranged, and which record ones of the video streams for time-delayed viewing; and

free blocks which are assignable to be designated as the circular buffer areas, or which record other ones of the video streams during a mode other than a time-delayed viewing mode.

20. (ORIGINAL) The recording medium of claim 18, wherein the control information area comprises:

file attribute information;

file assignment information;

free block information which manage the free blocks for each track of the recording medium; and

circular block information which manage the circular buffer blocks.

21. (ORIGINAL) A broadcast receiving system, comprising:

a hard disk drive having a hard disk as a recording medium, the recording medium having control information for recording an input signal and reproducing recorded information; and

a controller which sequentially assigns free blocks as discontinuous circular buffer blocks on the recording medium, based upon the control information in response to a time-delayed viewing mode being selected, and which records video streams for time-delayed viewing in the assigned circular buffer blocks.

22. (ORIGINAL) The broadcast receiving system of claim 21, further comprising:

a broadcast signal receiver comprising:

a first radio frequency tuner which receives an external broadcast signal,

a second radio frequency tuner which receives an external analog broadcast signal,

a video compressor which converts the received analog signal to a digital signal and compresses the digital signal, and

a selector which selectively enables transmission of the external digital broadcast signal and the compressed digital signal;

a random access memory which temporarily stores the selectively transmitted external digital broadcast signal and the compressed digital signal from the selector prior to recording on and subsequent to reading from the recording medium; and

a video recovery unit which restores the video streams read from the recording medium and temporarily stored in the random access memory to original signals.

23. (ORIGINAL) The broadcast receiving system of claim 21, further comprising:

an input device which enables simultaneous operation of the time-delayed viewing mode and a recording mode;

wherein the controller assigns free blocks of the recording medium, records the video streams of a channel to be recorded in the assigned free blocks in response to the selection of the simultaneous operation of the time-delayed and recording modes, assigns free blocks nearest to the recorded free blocks as circular buffer blocks, and records the video streams for time-delayed viewing in the assigned circular buffer blocks.

24. (ORIGINAL) The broadcast receiving system of claim 21, further comprising:

an input device which enables simultaneous selection of the time-delayed viewing mode and a reproduction mode;

wherein the controller reads blocks to be reproduced based on the control information, assigns free blocks nearest to the reproduced free blocks as the circular buffer blocks, and records the video streams for time-delayed viewing in the assigned circular buffer blocks, in response to the selection of the simultaneous operation of the time-delayed and reproduction modes.

25. (ORIGINAL) The broadcast receiving system of claim 21, wherein the controller updates the control information and sets a pointer of a write point to a last one of the assigned circular buffer blocks after recording the video streams.

26. (ORIGINAL) The broadcast receiving system of claim 21, wherein the hard disk drive comprises:

a control unit which controls the hard disk drive;

and an expander which expands the hard disk drive.

27. (ORIGINAL) The broadcast receiving system of claim 22, wherein the controller comprises:

a read-only memory which stores control program data to control the random access memory and the hard disk drive; and

a second random access memory which temporarily stores data during a control operation of the controller.

28. (ORIGINAL) The broadcast receiving system of claim 21, further comprising:

a random access memory which temporarily stores the video streams prior to recording on and subsequent to reading from the recording medium, wherein the random access memory comprises:

a control information copy area in which the control information is copied during system initialization of the broadcast receiving system,

a circular buffer pointer area having a pointer array which points to the circular buffer blocks, and

a video stream buffer area which buffers blocks of the video streams; and

a video recovery unit which restores the video streams read from the recording medium and temporarily stored in the random access memory to original signals.

29. (ORIGINAL) The broadcast receiving system of claim 28, wherein the circular buffer blocks form a circular buffer and write and read pointers of the circular buffer have specific pointer values in the random access memory so that the circular buffer blocks of the circular buffer are discontinuous.

30. (ORIGINAL) The broadcast receiving system of claim 21, wherein the controller sets a pointer of a write pointer to a last one of the assigned circular buffer blocks and changes the assigned circular buffer blocks to free blocks subsequent to recording the video streams for time-delayed viewing in the assigned circular buffer blocks.

31. (ORIGINAL) The broadcast receiving system of claim 28, wherein the controller sets a pointer of a write pointer to a last one of the assigned circular buffer blocks, changes the assigned circular buffer blocks to free blocks, and updates the control information in the control information copy area of the random access memory, subsequent to recording the video streams for time-delayed viewing in the assigned circular buffer blocks.

32. (PREVIOUSLY PRESENTED) A broadcast receiving system, comprising:

a hard disk drive having a hard disk as a recording medium, the recording medium having control information for recording an input signal and reproducing recorded information;

a controller which records a video stream in free blocks of the recording medium or reads a recorded video stream recorded on the recording medium and assigns free blocks nearest to the recorded or reproduced free blocks as circular buffer blocks.

IX. Evidence Appendix (37 C.F.R. § 41.37(c)(1)(ix))

None

X. Related Proceedings Appendix (37 C.F.R. § 41.37(c)(1)(x))

None